Configuring BaySecure FireWall-1

Router Software Version 11.02
Site Manager Software Version 5.02

Part No. 116751-A Rev. A
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Bay Networks

Bay Networks

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About This Guide

If you are responsible for network security, you need to read this guide to learn about BaySecure FireWall-1, and the steps you need to take to install, configure, and activate a firewall on a Bay Networks® router.

If you want to	Go to
Obtain a Check Point FireWall-1 license	page 1-2
Install Check Point firewall management software	page 1-3
Create and configure a firewall on the router	page 1-17
Enable the firewall on all router interfaces	page 1-21
Activate the firewall	page 1-22
Configure a security policy	page 1-23
Install the security policy on the router	page 1-24

Before You Begin

Before using this guide, you must complete the following procedures. For a new router:

- Install the router (refer to the installation manual that came with your router).
- Connect the router to the network and create a pilot configuration file (refer to *Quick-Starting Routers*, *Connecting AN and ANH Systems to a Network*, or *Connecting ASN Routers to a Network)*.

Make sure that you are running the latest version of Bay Networks Site Manager and router software. For instructions, refer to *Upgrading Routers from Version 7–10.xx to Version 11.0* and *Release Notes for Router Software Version 11.02*.

Conventions

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: if command syntax is **ping** *<ip_address>*, you enter **ping 192.32.10.12**
bold text	Indicates text that you need to enter, command names, and buttons in menu paths. Example: Enter **wfsm &**
	Example: Use the **dinfo** command.
	Example: ATM DXI > Interfaces > **PVCs** identifies the PVCs button in the window that appears when you select the Interfaces option from the ATM DXI menu.
italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.
`screen text`	Indicates data that appears on the screen. Example: `Set Bay Networks Trap Monitor Filters`
separator (>)	Separates menu and option names in instructions and internal pin-to-pin wire connections. Example: Protocols > AppleTalk identifies the AppleTalk option in the Protocols menu.
	Example: Pin 7 > 19 > 20

Acronyms

GUI	graphical user interface
IP	Internet Protocol
LAN	local area network
OSI	Open Systems Interconnection
TCP/IP	Transmission Control Protocol/Internet Protocol

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Chapter 1
BaySecure FireWall-1

BaySecure™ FireWall-1 integrates version 2.1 of Check Point Software Technologies Ltd™ FireWall-1™ software, with the exception of user authentication, address translation, statistics and encryption features, into the Bay Networks' GAME router operating system. The result is a security system that provides fully secure, bidirectional, anti-spoofing communication for all Internet applications and services, such as FTP, Telnet, and SMTP.

The Check Point FireWall-1 software consists of these two modules:

- *Firewall module* -- the firewall module inspects all data packets traveling between the data link and network layers, and either forwards or drops them according to the security policy you specify. It also provides communication between the firewall module and the control module. Bay Networks integrates the firewall module into the router operating system.
- *Control module* -- the control module allows you to manage the firewall and to define a security policy. The security policy determines the rules the FireWall-1 software uses to determine whether to let data pass or to log an error and alert the management station. The control module resides on a workstation, called the firewall management station.

For detailed information about the Check Point FireWall-1 software, refer to your Check Point documentation.

To configure a firewall on a router, see the following sections:

- Obtaining a FireWall-1 License on 1-2
- Installing and Running the FireWall-1 Management Software on 1-3
- Creating and Configuring a FireWall on the Router on 1-17
- Enabling the FireWall on All Router Interfaces on 1-21
- Activating the Firewall on 1-22
- Configuring a FireWall Security Policy on 1-23
- Installing the Security Policy on the Router on 1-24

Obtaining a FireWall-1 License

Before you can install the Check Point FireWall-1 software and create a firewall on the router, you must first obtain a FireWall-1 license. You need a separate FireWall-1 license for each router. To obtain a license:

1. **Locate your license certificate.**

   A FireWall-1 license certificate accompanies the Check Point FireWall-1 software media. On the license certificate you will find a FireWall-1 serial number. You must have your serial number to obtain a FireWall license.

   If you lose the license certificate bearing the FireWall-1 serial number, contact Bay Networks.

2. **Contact Check Point.**

   To obtain a permanent license, you must contact Check Point. You can reach Check Point

   - Via the world wide web at **http://license.CheckPoint.com**
   - By sending mail to license@checkpoint.com
   - By phoning Check Point:

     800-429-4391 (North America)

     +972-3-613-1833 (outside North America)

   When requesting a license, you must provide the serial number from the license certificate, as well as information, such as IP addresses, regarding the end user and the hosts on which you plan to install the FireWall-1 software.

Note: If you need to change the IP address of the FireWall-1 management station, contact Check Point at 800-429-4391 (North America) or +972-3-613-1833 (locations outside of North America).

Refer to the section "Installing and Running the FireWall-1 Management Software " and the Check Point documentation for information about how to install the license.

Installing and Running the FireWall-1 Management Software

Once you obtain a FireWall-1 license from Check Point, you can install the Check Point FireWall-1 management software on either the UNIX or Windows/NT platform.

Installing on the UNIX Platform

Before you install the Check Point software, be sure to

- Contact Check Point to get a license
- Add **setenv FWDIR/etc/fw** to your *.cshrc* file, or add **FWDIR=/etc/fw** to your *.cshrc* file and export FWDIR to your *.profile* file
- Add **/etc/fw/bin** to your path
- Add **/etc/fw/man** to your MANPATH environment

Use the following sections as a guide to installing the FireWall-1 software on the UNIX platform. For more details, refer to your Check Point documentation.

Mounting the CD and Extracting the Tar File

Check Point supplies its FireWall-1 software on CD-ROM. You must mount the CD drive and extract the tar files.

Commands used to mount a CD drive and extract the tar files vary depending the device name of the CD drive, the operating system used, and other environmental factors. Use the instructions that follow only as guidelines for mounting the CD drive and extracting the tar files. The commands you need may differ.

For SunOS

```
lab#  mount -r -t hsfs /dev/sr0 /cdrom
lab#  cd /tmp
lab#  tar xvf /cdrom/sunos4/fw1/fw.sunos4.tar
```

For Solaris

```
lab#  mount -F hsfs -r /dev/sr0 /cdrom
lab#  cd /tmp
lab#  tar xvf /cdrom/solaris2/fw1/fw.solaris2.tar
```

For HPUX

```
lab#  mount -r /dev/dsk/c1t2d0 (or your specific CD-ROM address)  /cdrom
lab#  cd /tmp
lab#  tar xvf  "/cdrom/HPUX/FW1/FW.HPUX.TAR;1"
```

Installing the Check Point FireWall-1 Software

Once you have extracted the Check Point FireWall-1 files, you can install the management software. To install the software, change directories so that you're in the directory where you put the files and then issue the **fwinstall** command.

For example, if you extracted the files into your */tmp* directory, install the software by issuing the following commands:

```
lab#  cd /tmp
lab#  ./fwinstall
```

Installation Options

Note that during the installation, the script asks you to select the FireWall-1 option you want to install. To be compatible with BaySecure FireWall-1, enter selection 3, FireWall-1 Enterprise Management Console Product. A sample follows.

```
Which of the following FireWall-1 options do you wish to install?

(1) FireWall-1 Enterprise Product
(2) FireWall-1 Single Gateway Product
(3) FireWall-1 Enterprise Management Console Product
(4) FireWall-1 FireWall Module
(5) FireWall-1 Inspection Module

Enter your selection (1-7/a): 3
```

Sample Installation

The following sample installation takes the Check Point FireWall-1 software from a CD-ROM and installs it onto a SparcStation running SunOS. Use this sample installation to familiarize yourself with the FireWall-1 installation script.

Note: In the following sample installation, all user input is in **bold**.

```
*************** FireWall-1 v3.0 Installation ***************

Reading fwinstall configuration.  This might take a while.
Please wait.

Configuration loaded.  Running FireWall-1 Setup.

Checking available options. Please wait.....................

Which of the following FireWall-1 options do you wish to
install/configure ?
------------------------------------------------------------------------
(1) FireWall-1 Enterprise Product
(2) FireWall-1 Single Gateway Product
(3) FireWall-1 Enterprise Management Console Product
(4) FireWall-1 FireWall Module
(5) FireWall-1 Inspection Module

Enter your selection (1-5/a): 3

Installing/Configuring FireWall-1 Enterprise Management Console Product.

Please wait...

Selecting where to install FireWall-1
--------------------------------------
FireWall-1 requires approximately 9017 KB of free disk space.
Additional space is recommended for logging information.

Enter destination directory [/etc/fw]): <RETURN>

Checking disk space availability...

Installing FW under /etc/fw (50836 KB free)
Are you sure (y/n) [y] ? y
```

```
Software distribution extraction
--------------------------------
Extracting software distribution. Please wait ...
Software Distribution Extracted to /etc/fw
Installing license
------------------
Reading pre-installed license file fw.LICENSE... done.

The following evaluation License key is provided with this FireWall-1
distribution
Eval            15Mar97    3.x pfmx controlx routers connect motif

Do you want to use this evaluation FW-1 license (y/n) [y]? n

Do you wish to start FireWall-1 automatically from /etc/rc.local (y/n)
[y] ? n


Welcome to FireWall-1 Configuration Program
===========================================
This program will guide you through several steps where you
will defined your FireWall-1 configuration. In any later time,
you can reconfigure these parameters by running fwconfig


Configuring Licenses...
=======================
The following licenses are installed on this host:
Eval            15Mar97    3.x pfmx controlx routers connect motif

Do you want to add licenses (y/n) [n] ? n


Configuring Administrators...
=============================
No FireWall-1 Administrators are currently defined for this Management
Station.

Do you want to add users (y/n) [y] ? n


Configuring GUI clients...
==========================
GUI clients are trusted hosts from which FireWall-1 Administrators are
allowed to log on to this Management Station using Windows/X-Motif GUI.

Do you want to add GUI clients (y/n) [y] ? n
```

```
Configuring Remote Modules...
=============================
Remote Modules are FireWall or Inspection Modules that are going
to be controlled by this Management Station.

Do you want to add Remote Modules (y/n) [y] ? n

Configuring Groups...
=====================
FireWall-1 access and execution permissions
-------------------------------------------
Usually, FireWall-1 is given group permission for access and execution.
You may now name such a group or instruct the installation procedure
to give no group permissions to FireWall-1. In the latter case, only the
Super-User will be able to access and execute FireWall-1.

Please specify group name [<RET> for no group permissions]:

No group permissions will be granted. Is this ok (y/n) [y] ? y

Configuring Random Pool...
==========================
You are now asked to perform a short random keystroke session.
The random data collected in this session will be used for
generating Certificate Authority RSA keys.

Please enter random text containing at least six different
characters. You will see the '*' symbol after keystrokes that
are too fast or too similar to preceding keystrokes. These
keystrokes will be ignored.

Please keep typing until you hear the beep and the bar is full.

    [                   ] *

Thank you.

Configuring CA Keys...
======================
fw: no license for 'ca'
The installation procedure is now creating an FWZ Certificate Authority
Key
for this host. This can take several minutes. Please wait...
fw: no license for 'ca'

Configuration ended successfully

**************** FireWall-1 is now installed. ***************
```

```
Do you wish to start FW-1 now (y/n) [y] ? n
*****************************************************************
Configuration ended successfully

*************** FireWall-1 is now installed. ***************

Do you wish to start FW-1 now (y/n) [y] ? n

*****************************************************************
               DO NOT FORGET TO:
1. add the line:    setenv FWDIR /etc/fw   to .cshrc
               or  FWDIR=/etc/fw; export FWDIR to .profile
2. add  /etc/fw/bin  to path
3. add  /etc/fw/man  to MANPATH environment
*****************************************************************

You may configure FireWall-1 anytime, by running fwconfig.

*************** Installation completed successfully ***************
```

Customizing the FireWall-1 Installation

You can use the **fwconfig** command to customize your FireWall-1 installation. Using **fwconfig**, you can add

- A license
- Administrators
- GUI clients
- Remote modules
- Groups
- CA keys

Note: To add an administrator, you must first add a group to which the user is a member. If you do not add a group, then you can run the GUI using only the **fwui** command if you are logged in as root.

Refer to your Check Point documentation for details.

Installing a License on the Management Station

To install a license on the management station, use the following command:

fw putlic *<hostid> <lic_string>* pfmx controlx routers motif embedded

The <*hostid*> is the host ID of the management station.

The <*lic_string*> is a string of alphanumeric characters that Check Point provides when you request your FireWall-1 license.

Starting and Stopping the FireWall-1 Daemons

To start the FireWall-1 daemons, use the **fwstart** command. For example, at the system prompt, type

```
lab# fwstart
```

To stop the FireWall-1 daemons, use the **fwstart** command. For example, at the system prompt, type

```
lab# fwstop
```

Synchronizing the Management Station and the Router Passwords

Once you have installed licenses on the management station and the router, you must synchronize your password on the two systems. To synchronize the router and the management station passwords, enter the following commands:

- On the firewall management station:

  fw putkey -p*<password> <ip_address_fwall_router>*

- On the router:

  fwputkey *<password> <ip_address_mgmt_station>*

  where

<password>	is a string of alphanumeric characters that comprise your password
<ip_address_fwall_router>	is the IP address of your firewalled router
<ip_address_mgmt_station>	is the IP address of your FireWall-1 GUI management station

Starting the FireWall-1 GUI

To start the FireWall-1 GUI, enter the **fwui&** command. For example, at the system prompt, type

```
lab# fwui&
```

Installing on the Windows/NT Platform

Use the following sections as a guide to installing the FireWall-1 software on the Windows/NT platform. For more details, refer to your Check Point documentation.

Sample Installation

The following sample installation takes the Check Point FireWall-1 software from a CD-ROM and installs it onto a PC running Windows/NT. Use this sample installation to familiarize yourself with the way the screens appear during a basic FireWall-1 installation.

Note: This sample installation shows only those screens necessary for a basic installation.

Installing the Management Software

1. **Begin by inserting the CD into the CD drive and executing the *setup.exe* file. For example:**

   D:\windows\fw1\setup.exe

   The Choose Destination Location window (Figure 1-1) opens.

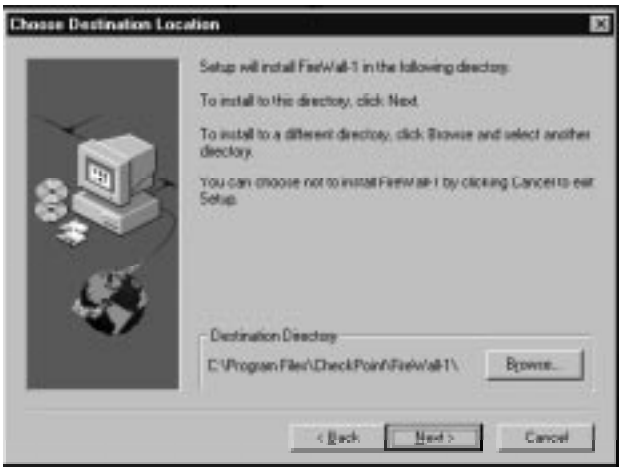
Choose Destination Location
Setup will install FireWall-1 in the following directory.
To install to this directory, click Next.
To install to a different directory, click Browse and select another directory.
You can choose not to install FireWall-1 by clicking Cancel to exit Setup.
Destination Directory
C:\Program Files\CheckPoint\FireWall-1\
Browse...
< Back
Next >
Cancel

Figure 1-1. Choose Destination Location Window

2. **Choose a destination directory. For this sample installation, we accept the default directory.**
3. **Click on Next.**

   The Selecting Product Type window (Figure 1-2) opens.

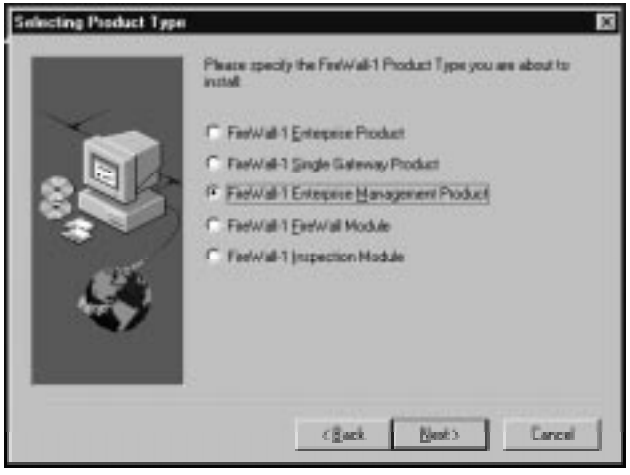
Selecting Product Type
Please specify the FireWall-1 Product Type you are about to install.
FireWall-1 Enterprise Product
FireWall-1 Single Gateway Product
FireWall-1 Enterprise Management Product
FireWall-1 FireWall Module
FireWall-1 Inspection Module
< Back
Next >
Cancel

Figure 1-2. Selecting Product Type Window

4. **Choose the FireWall-1 component you want to install. To be compatible with BaySecure FireWall-1, choose FireWall-1 Enterprise Management Console Product.**
5. **Click on Next.**

   The Licenses window (Figure 1-3) opens.

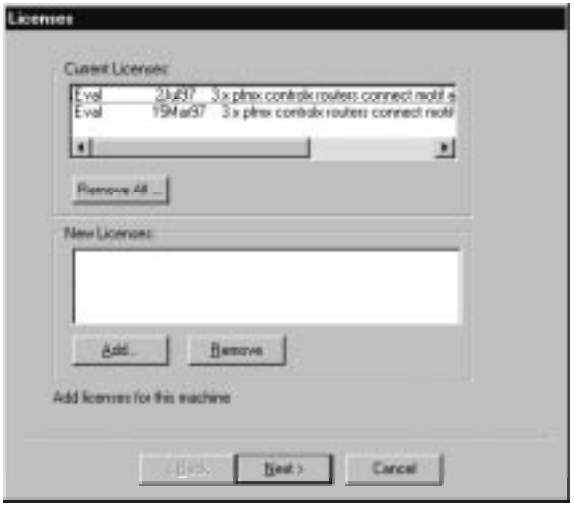

Figure 1-3. Licenses Window

6. **Enter the license information you obtained from Check Point.**
7. **Click on Next.**

The Administrators window (Figure 1-4) opens.

Figure 1-4. Administrators Window

You must specify at least one administrator.

8. **Click on Add.**

   The Add Administrator window (Figure 1-5) opens.

Figure 1-5. Add Administrators Window

9. **Enter the administrator's user name and password, which is limited to eight characters, and a password confirmation, and click on OK. You return to the Administrators window.**

10. **Click on Next.**

    The GUI Clients window opens. Do not enter GUI clients at this time.

11. **Click on Next.**

    The Remote Modules window appears. Do not enter remoter modules at this time.

12. **Click on Next.**

    The Hit Key Session window (Figure 1-6) opens.

Figure 1-6. Hit Key Session Window

13. **Follow the directions in the window and enter random characters, with a delay of a few seconds between them, until the indicator bar is full.**

    Be sure not to type the same character twice in a row and vary the delay between the characters.

14. **Click on Next.**

The CA Key window opens (Figure 1-7).

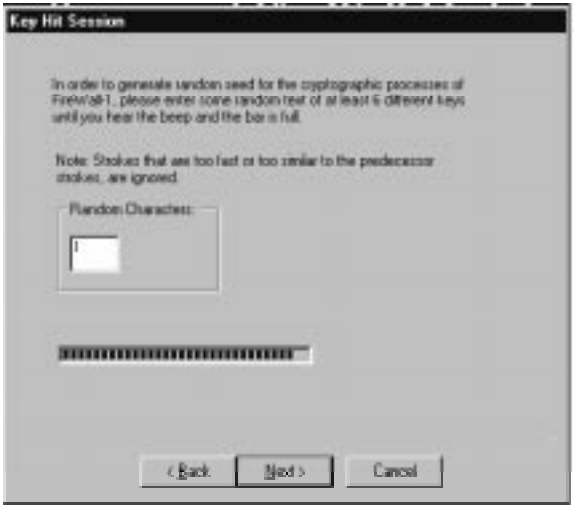

Figure 1-7. CA Key Window

15. **Click on Generate to generate a new key.**

    The host uses the RSA key to generate a digital signal for authenticating its communications in its capacity as a Certificate Authority.

    Generating the key may take several minutes.

16. **Click on Finish.**

Installing the GUI Client

1. **Begin by inserting the CD into the CD drive and executing the *setup.exe* file. For example:**

   `D:\windows\gui_client\disk1\setup.exe`

   The Choose Destination Location window (Figure 1-8) opens.

2. **Choose a destination directory.**

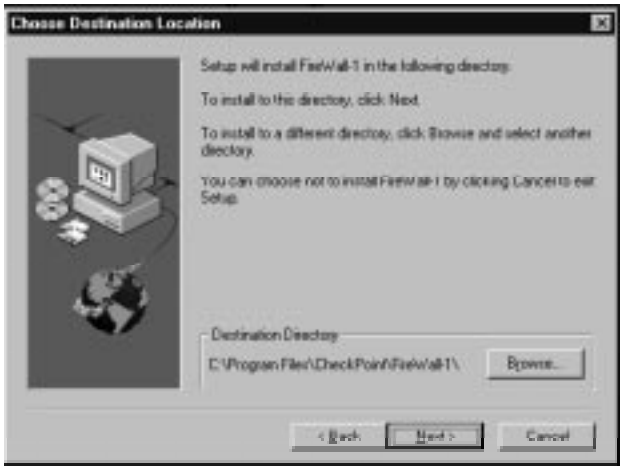
Choose Destination Location
Setup will install FireWall-1 in the following directory.
To install to this directory, click Next.
To install to a different directory, click Browse and select another directory.
You can choose not to install FireWall-1 by clicking Cancel to exit Setup.
Destination Directory
C:\Program Files\CheckPoint\FireWall-1\
Browse...
< Back
Next >
Cancel

Figure 1-8. Choose Destination Location Window

For this sample installation, accept the default directory.

3. **Click on Next.**

The Select Components window (Figure 1-9) opens.

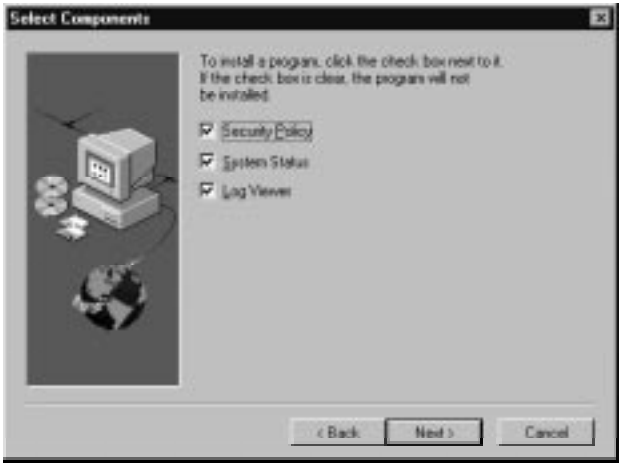
Select Components
To install a program, click the check box next to it. If the check box is clear, the program will not be installed.
Security Policy
System Status
Log Viewer
< Back
Next >
Cancel

Figure 1-9. Select Components Window

4. **Install the Security Policy, System Status, and Log Viewer components by clicking on each item.**

Customizing the FireWall-1 Installation

You can customize your FireWall-1 installation by executing the *FireWall-1 Configuration* file. To execute the file, enter

`D:`**\Start\Programs\FireWall-1\FireWall-1 Configuration**

Using the *FireWall-1 Configuration* file, you can add

- A license
- Administrators
- GUI clients
- Remote modules
- CA keys

Refer to your Check Point documentation for details.

Creating and Configuring a FireWall on the Router

This section explains how to create a firewall on the router using Site Manager.

You can also use the Technician Interface, which lets you modify parameters by issuing **set** and **commit** commands that specify the MIB object ID. This process is equivalent to modifying parameters using Site Manager. For more information about using the Technician Interface to access the MIB, refer to *Using Technician Interface Software*.

Caution: The Technician Interface does not verify that the value you enter for a parameter is valid. Entering an invalid value can corrupt your configuration.

Before you begin, you must first configure and enable IP on the router and enable TCP on all slots on the router. Refer to *Quick Starting Routers* for instructions.

Begin by starting Site Manager. Then follow these steps:

1. **Select Configuration Manager in either local, remote, or dynamic mode from the Tools menu.**

   The Configuration Manager window opens (Figure 1-10).

Figure 1-10. Configuration Manager Window

2. **Open a configuration file if local or remote mode is selected.**
3. **Select Protocols > Global Protocols > FWALL > Create.**

   The following confirmation box appears to verify that you have created a firewall on the router.

4. **Click on OK.**

Note: After you create a firewall on the router, you cannot remove it.

5. **To enable the firewall, select Protocols > Global Protocols > FWALL > Global.**

   The F.W. Global window opens (Figure 1-11) to verify that you want to enable a firewall to be active on the router. Click on OK.

Figure 1-11. F.W. Global Window

6. **To configure the firewall, select Protocols > Global Protocols > FWALL > FWALL Router PARAMS.**

   A warning box appears, indicating that you may need to establish a static route between the router and the management station before you configure the parameters.

   If you do not establish a static route and your management station and router are on different subnets, you will be unable to communicate with the router. Refer to *Configuring IP Services* for information about creating a static route.

7. **Click on OK.**

The F.W. Router Parameters window opens (Figure 1-12).

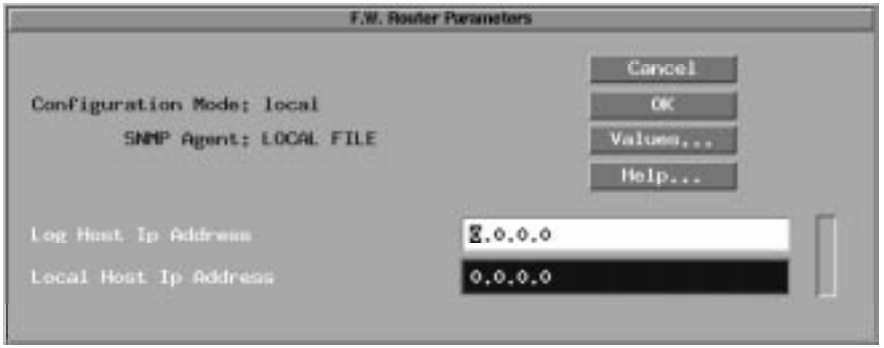

Figure 1-12. F.W. Router Parameters Window

8. Complete the F.W. Router Parameters window.

To configure a firewall, you must supply values for all of the parameters that appear in the F.W. Router Parameters window. Refer to the parameter descriptions that follow. When you finish configuring the parameters, click on OK to make all parameter settings take effect.

Parameter:	**Log Host IP Address**
Default:	0.0.0.0
Options:	Any valid IP address
Function:	Shows the IP address of the host on which you installed the FireWall-1 management software. This host becomes the firewall management station, from which you control the firewall. The management station also logs all violations of the security rule base.
Instructions:	Enter the IP address of the host where you installed the control module. If the log host IP address and the local host IP address you specify are on different subnets, then you must configure a static route to the local host IP address to enable communication between the router and the management station. *Configuring IP Services* provides information about configuring a static route.
MIB Object ID:	1.3.6.1.4.1.18.3.5.1.11.2.4

Parameter:	**Local Host IP Address**
Default:	0.0.0.0
Options:	Any valid IP address
Function:	Shows the IP address of the router on which the firewall resides.
Instructions:	Enter the IP address of the host where you installed the firewall module. If the log host IP address and the local host IP address you specify are on different subnets, then you must configure a static route to the local host IP address to enable communication between the router and the management station. *Configuring IP Services* provides information about configuring a static route.
MIB Object ID:	1.3.6.1.4.1.18.3.5.1.11.2.6

Enabling the FireWall on All Router Interfaces

After you have created a firewall on the router, you can enable it on all interfaces by selecting **Protocols > Global Protocols > FWALL > Interfaces** from the Configuration Manager window.

The FW on ALL Interfaces window (Figure 1-13) opens to verify that you enabled the firewall on all interfaces.

Figure 1-13. FW on ALL Interfaces Window

Click on OK to enable the firewall on all router interfaces. Otherwise, click on Cancel.

When you click on OK, a message box opens, confirming that you are enabling the firewall on all interfaces.

Once you enable the firewall on all interfaces and reboot the router, you will not be able to communicate with the router through Site Manager until you change the FireWall-1 default security policy.

Caution: If your firewall management station and router are on different subnets, you will not be able to communicate with the router from the management station unless you establish a static route from the management station to the router before you activate the firewall. Refer to *Configuring IP Services* for information about creating a static route.

Activating the Firewall

Before the FireWall-1 security policy will take effect on the router, you must first activate the firewall by booting the router. Booting a router warm-starts every processor module in the router. Pressing the Reset button on the front panel of the router performs the same procedure.

Note: When you activate the firewall, the default security policy prevents all interfaces supported by the firewall from communicating with the router. If the firewalled router and management station are on different subnets, you must establish a static route to enable communication between the router and the management station before you activate the firewall. For information about configuring a static route, refer to *Configuring IP Services.*

Use the Administration menu to reboot the router.

1. **From the main Site Manager window, select Administration > Boot Router.**

The Boot Router window opens (Figure 1-14).

Figure 1-14. Boot Router Window

2. **Specify the correct volume and boot image.**
3. **Select the correct router volume and configuration file. Then click on Boot.**

   A confirmation window appears.
4. **Click on OK in the confirmation window and wait a few minutes to give the router time to reboot.**
5. **Select View > Refresh Display from the main Site Manager window to verify that the router booted correctly.**

If the router booted correctly, system information appears in the main Site Manager window.

If the router did not boot correctly, system information does not appear. In this case, make sure that you followed the procedures described in this section.

If you have any questions, refer to *Managing Routers* or call your local Bay Networks Technical Response Center.

Configuring a FireWall Security Policy

A security policy is a collection of rules that define the way the firewall operates. Check Point supplies a default security policy that drops all attempts at communication with the router. This security policy goes into effect when you first activate the firewall on the router.

You must define a security policy that explicitly defines acceptable communication to the router, based on the source address, destination address, and type of service. Refer to your Check Point FireWall-1 documentation for details about how to configure a security policy.

Installing the Security Policy on the Router

Once you have defined a security policy, you must install it on the router. Installing a security policy means downloading it to the firewalled objects that will enforce it.

When you download the security policy, the FireWall-1 software

- Verifies that the rule base is logical and consistent
- Generates an inspection script from the rule base
- Compiles the inspection script to generate inspection code for the router
- Downloads the inspection code to the router

For information about how to install the security policy, refer to your Check Point documentation.

Troubleshooting Checklist

If you experience problems with FireWall-1, verify that you have performed these steps:

- Enabled TCP on all slots on the router
- Created a firewall using Site Manager
- Created a static route if the router and firewall management stations are on different subnets
- Rebooted the router with a firewall configuration file
- Synchronized the router and management station passwords
- Defined a security policy
- Installed the security policy on the router

If you have performed these steps and are still having system problems, contact Bay Networks.

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